

ABSTRACT

A thermoelectric conversion material and a thermoelectric conversion device having a novel structure of an increased figure of merit are provided by forming nano-wires of thermoelectric material in a smaller cross-sectional size. The thermoelectric conversion material comprises nano-wires obtained by introducing a thermoelectric material (semiconductor material) into columnar pores of a porous body. The porous body is formed by providing a structure in which columns of a column-forming material containing a first component (for example, aluminum) are distributed in a matrix containing a second component (for example, silicon or germanium or a mixture of them) being eutectic with the first component, and then removing the column-forming material from the structure. The average diameter of the nano-wires of the thermoelectric material is 0.5 nm or more and less than 15 nm, and the spacing of the nano-wires is 5 nm or more and less than 20 nm.